



# **GURU NANAK INSTITUTE OF ENGINEERING & TECHNOLOGY, NAGPUR**

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*Presented on:-*

## *Plant Leaves Disease Detection*

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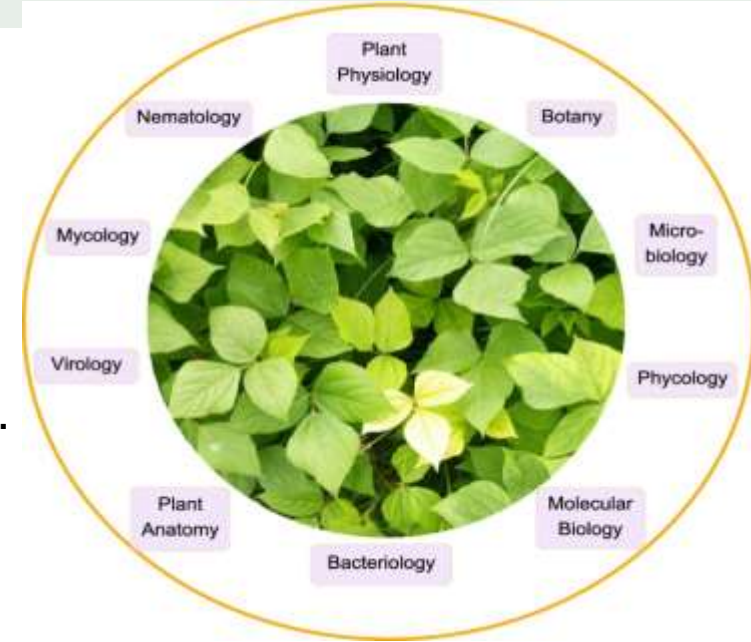
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# INTRODUCTION

- To detect unhealthy regions of plants leaves.
- Classification of plant leaf diseases using texture features.
- To analyse the leaf infection.
- To give remedy information to the user.
- Diseases in plants cause major production and economic losses in agriculture industry worldwide.
- Early information on crop health and disease detection can facilitate the control of diseases.
- We have created a convolutional neural network which will be able to predict whether a plant is suffering from a disease or not.



# Abstract



- ❑ Plant Disease Prediction is an application which will detect and provide some remedial measures for diseases in the crop to the users.
- ❑ Initially the client can either click or upload the image of the diseased crop in the application.
- ❑ Once the plant disease is matched with the existing data, then the effective remedial measures such as what action should they take about the disease is provided.
- ❑ The image is processed for the effective remedial measures using the machine learning InceptionV3 Algorithm.
- ❑ In its current form, our application would be as a preliminary tool that could assess the users by providing some remedial measures like what type of fertilizers to use and the measures to be taken by comparing it with the datasets provided in the database.

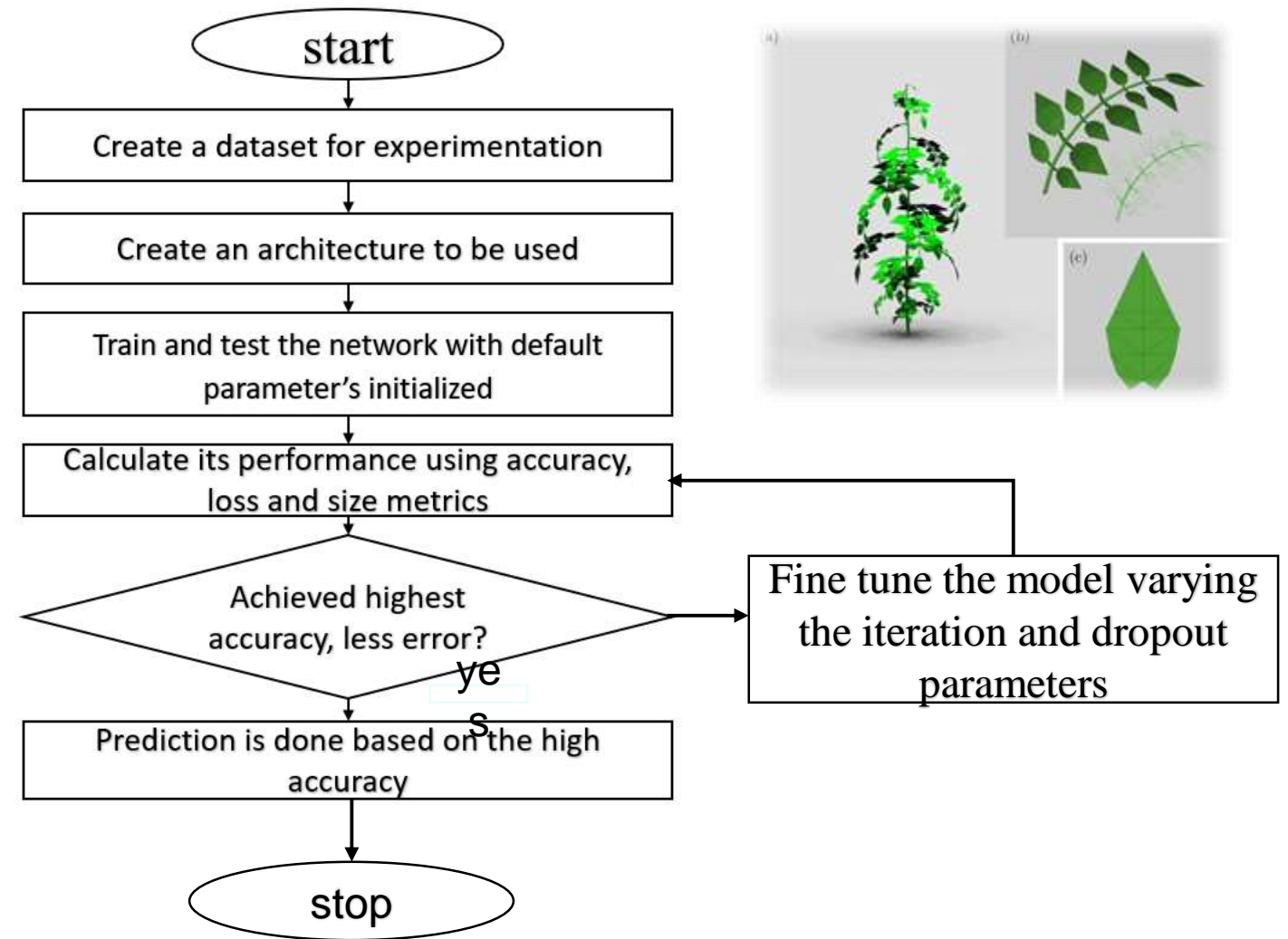


# Literature Survey



- ❑ In 2015, S. Khirade et Al. tackled the problem of plant disease detection using digital image processing techniques and **back propagation neural network** (BPNN) 'Authors have elaborated different techniques for the detection of plant disease using the images of leaves..
- ❑ After that they have extracted the features such as color, texture, morphology, edges etc. for classification of plant disease. BPNN is used for classification i.e.. to detect the plant disease
- ❑ Plants are considered as energy supply to mankind. Plant diseases can affect the agriculture which can be resulted in to huge loss on the crop yield.
- ❑ Therefore, leaf diseases detection plays a vital role in agricultural field. However, it requires large manpower, more processing time and extensive knowledge and skills about plant diseases.
- ❑ Hence, machine learning comes in play in the detection of diseases in plant leaves as it analyzes the data. from various areas, and classifies it into one of the predefined set of classes.
- ❑ The features and properties like color, intensity and dimensions of the plant leaves are considered as a major fact for classification and the various types of plant diseases and different classification techniques in machine learning that are used for identifying diseases in different plants leaf.

# Dataflow Diagram



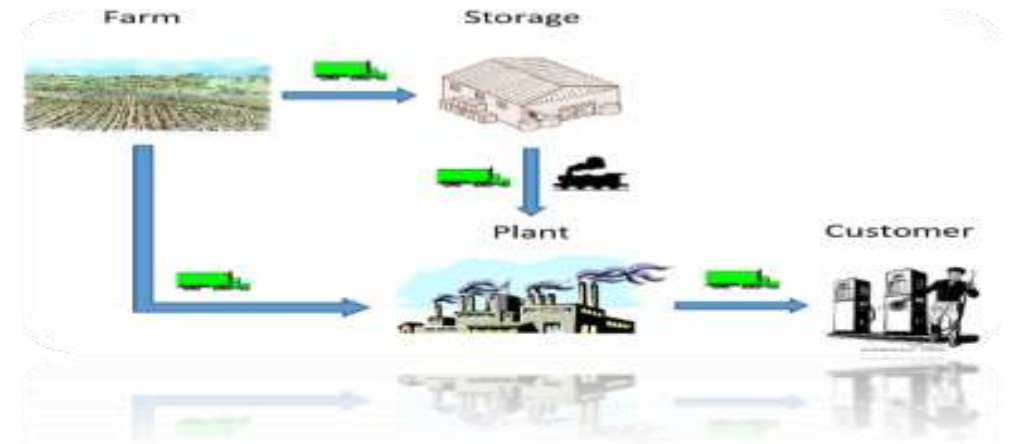
# Applications

- **Precision Agriculture:** Early disease detection and targeted treatment minimize crop loss and reduce chemical usage.
- **Automated Monitoring Systems:** Drones, satellites, and IoT devices provide real-time crop health monitoring and disease alerts.
- **AI-Powered Mobile Apps:** AI-driven apps offer instant leaf disease diagnosis, treatment suggestions, and data analysis for farmers.
- **Crop Yield Optimization:** Integrating disease detection with agronomic data enhances disease management and resource efficiency.



- **Research and Development:** Leaf disease detection aids in developing disease-resistant crops and sustainable farming practices.
- **Supply Chain Management:** Ensures quality control and accurate crop yield predictions for market stability.
- **Global Food Security:** Reduces crop losses and empowers smallholder farmers, enhancing food security and livelihoods.





# Implementation





# Future scope of project

- ✓ Our project have shown pretty good accuracy, it can be implemented in real time mobile applications and web services, so that formers can identify diseases simply by taking photo of suspected leaves of plants.
- ✓ Other than plant leaf disease identification, it can also be used for identification and classification of nutrients deficiency of plant leaves.
- ✓ Our project have shown pretty good accuracy, it can be implemented in real time mobile applications and web services, so that formers can identify diseases simply by taking photo of suspected leaves of plants.
- ✓ Other than plant leaf disease identification, it can also be used for identification and classification of nutrients deficiency of plant leaves.



# CONCLUSION



We have successfully developed a computer vision based system for plant disease detection with average 93% accuracy.

Also the proposed system is computationally efficient because of the use of statistical image processing and machine learning model. Table 3 illustrates the overall benefits of our system over the other approaches.

Our project is deployed into the web application. It can be extended to use as an embedded application.

More number of the images can be added to improve accuracy along with the testing of transfer learning. For the large scale open field cultivation we can use real time monitoring using drones and other autonomous agriculture vehicles.



\*\*\*Thank you\*\*\*

